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This study was undertaken to formulate recommendations for the improvement of the academic and professional preparation of teachers of mathematics in secondary schools as offered at the State Teachers College at Edinboro, Pa.

Two questionnaires were used. The first sought opinions of secondary school administrators and college teachers of education and mathematics; the second sought information from secondary school teachers of mathematics. The participating secondary school administrators and teachers represented all four classes of school systems and all types of public secondary schools in all of the counties of Pennsylvania. All teacher-preparing institutions in Pennsylvania and 20 comparable colleges and universities in neighboring States were asked to cooperate. Of the 580 questionnaires distributed, 370 (62.8 percent) were returned in usable form.

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ACADEMIC AND PROFESSIONAL PREPARATION OF SECONDARY SCHOOL TEACHERS OF MATHEMATICS

- Harry W. Earlley -

HE7459

Introduction

The typical teachers college does not offer much that is helpful in preparing students for teaching the general mathematics courses that now enroll a majority of high school pupils. The conventional methematics courses provide a satisfactory background for the traditional high school courses but do not provide adequately for the newer courses that are being adopted to meet the general education needs of pupils.

Statement of the Problem

The purpose of the study was to formulate recommendations for the improvement of the academic and professional preparation of teachers of mathematics in secondary schools as offered at the State Teachers College at Edinboro, Pennsylvania. The elements of the problem were:

A. What is the present status of preparation of teachers of mathematics in the secondary schools of Pennsylvania?

B. What are the duties for which these teachers are responsible?

C. What are the opinions of teachers of mathematics in secondary schools and the opinions of others closely allied with the preparation, employment, and supervision regarding means for the improvement of their preparation?

Procedure

A thorough search of pertinent literature and related research was made.

The normative survey method using the questionnaire technique was employed. Two questionnaires were used. The first sought the opinions of three groups of people: namely, secondary school administrators, college teachers of education, and college teachers of mathematics. The secondary questionnaire, more detailed than the first, was designed to gather information from secondary school teachers of mathematics. The participating secondary school administrators and teachers represent all four classes of school systems and all types of public secondary schools in all of the counties of Pennsylvania. All teacher-preparing institutions in Pennsylvania and 20 comparable colleges and universities in neighboring states were asked to cooperate.

Of the 589 questionnaires distributed 370, or 62.8 per cent were returned in usable form.

Findings

1. More than 70 per cent of all secondary school teachers of mathematics

ED000121

studied the traditional high school courses in mathematics and the traditional sequence of college mathematics through the calculus.

2. Statistics was studied by 60 per cent of the teachers but only 36 per cent had studied History of Mathematics. Less than 20 per cent had studied Field Work in Mathematics or Mathematics of Finance, and only four per cent had studies Critical Review of Secondary Mathematics.

3. All teachers have earned bachelors' degrees, 48 per cent have earned masters' degrees, and two have earned doctors' degrees.

4. Graduate work has been done by 83 per cent of the teachers.

5. Mathematics was the undergraduate major field of study for 56 per cent of the teachers.

6. Actively engaged in furthering their formal education were 23 per cent of the teachers.

7. The median number of years of teaching experience was found to be in the 16-18 year interval.

8. Sixteen per cent of the teachers did not read regularly any professional mathematics magazine.

9. Classes in mathematics only were taught by 73.6 per cent of all secondary school teachers of mathematics; in mathematics and one other subject of 16.4 per cent; in mathematics and two other subjects by 8.2 per cent; in mathematics and three other subjects by 1.7 per cent.

10. Of the 468 classes in mathematics taught 290 were of the traditional high school type and 178, or 38 per cent, were of the general or related type.

A check list consisting of 74 courses segregated into the three broad categories of mathematics, education, and general education asked the respondents to select courses on the basis of importance to success in teaching mathematics in the secondary schools. When the highest-ranking 20 courses deemed of primary importance was compiled for each of the four groups of people participating, it was discovered that 14 of the 20 courses on each list were the same. These 14 courses were:

1. Advanced Algebra
2. Analytic Geometry
3. Audio-Visual Education
4. College Algebra
5. College Geometry
6. Educational Measurements
7. Educational Psychology
8. General Psychology
9. High School Methods
10. Paychology of Adolescence
11. Solid Geometry

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12. Student Teaching
13. Teaching Mathematics in Secondary Schools
14. Trigonometry

Secondary school administrators and all teachers were definitely in favor of a separate college course designed to stress the applications of mathematical concepts. College teachers of education were in favor of such a course, but not decidely so; college teachers of mathematics were strongly opposed to such a plan.

Secondary school administrators and college personnel favored the use of the combined efforts of college authorities and the state Department of Education in any attempt to raise the standards for the certification of teachers.

Recommendations

1. A course in the applications of mathematics should be offered.

2. Prospective teachers of mathematics should be required to earn the necessary qualifications for certification in a major field and also certification in two closely related minor fields; for example, a major in mathematics and minors in physics and chemistry.

3. Secondary schools participating in the observation and practice teaching phase of teacher training should be provided with up-to-date mathematical instruments, equipment, and supplies and the use of these materials should be encouraged when pertinent to classroom work.

4. Practice teaching in mathematics should be under the direction of a professor who has had graduate training in mathematics, who has taught at the secondary level, and who has kept abreast of the situation in the secondary schools.

5. The possibility of offering a master's degree in mathematics designed primarily for teachers of secondary mathematics should be studies and plans should be formulated for its inception.